BOOK 2

ISBN : 978-602-8915-93-9

ISNAR-C2FS 2011

International Seminar on Natural Resources, Climate Change and Food Security in Developing Countries

Proceeding

UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"

PHILIPPINE SOCIETY FOR THE STUDY OF NATURE 2000

International Seminar Natural Resources, Climate Change and Food Secu
in Developing Countries - ISNAR C2FS
June 27 - 28, 2011 Graha Pena Building, Surabaya - Indonesia
ISBN : 978-602-8915-93-9

Copyright : December 2011
Published by : Faculty of Agriculture, University of Pembangunan Nasional "Veteran" E
Java, Indonesia

Held in between :
- *Faculty of Agriculture, University of Pembangunan Nasional "Veteran" East Java, Indonesia*
- *Philippine Society for The Study of Nature (PSSN), Philippine*
- *CAB - University of Kasetsart, Thailand*

FOREWORD

Dear Participants,

Faculty of Agriculture University of Pembangunan Nasional "Veteran' East Java, Indonesia and Philippine Society for The Study of Nature, Inc. (PSSN) are proud to present International Seminar 2011, with theme "Natural Resources Climate Change and Food Security In Developing Countries (ISNAR C2FS)".

Faculty of Agriculture University of Pembangunan Nasional "Veteran" East Java is one of famoust agricultural faculty for along time in Surabaya since 1968 with a lot of prestation in academic such as periodically hold in regional seminar also international seminar, and have collaboration with Philippine Society for The Study of Nature, Inc (PSSN) is a professional organization, consists of research institutions and universities. In this Faculty we have established Indonesian Society for the Study of Nature (ISSNAT) as a patner and under one umbrella with PSSN. Some officers of ISSNAT formally have been endorsed by Prof. Dr. Irsal Las, MSc. from the ministry of agriculture.

This international seminar, which is the first of a two-years agenda of Faculty of Agriculture, is an ideal forum for communicating and sharing of ideas as well experiences on climate change or global warming especially that impact to biodiversity and conservation, adaptation and production, bioproduct and post harvest, agroforestry and environmental management, social and economic issues and strategy and food security policy.

During the international seminar for the first time, some awards were given to participants who were the winners represent from various competion programmes such as best paper award, student best paper and poster presenters. It is expected that such award could be presented continually in the coming international seminar held by Faculty of Agriculture.

On behalf of the organizing committee would like to express its sincere appreciation to all supporting parties for the success of seminar and for the publication of the proceeding.

Dr. Sukendah, MSc
Chairman

Honorable Minister of Agriculture
Honorable Mayor of Surabaya
Honorable Speakers and Paticipans
Distinguished Guests, Ladies and Gentlemen.

At this precious moment, let us first express our gratitude to theMerciful God who has granted us with blessings and grace that we coud gather here today to attend the International Seminar on Natural Resources, Climate Change and Food Security in Developing Countries. Let me extend my warmest greetings and welcome to our distinguished speakers and participants, particulary those from abroad, my heartfelt welcome to our beloved city, Surabaya.I would like to express my appreciation to each of you for having attending this International Seminar.

As some of us may probably know, there has been cooperation between Philippine Society forthe Study of Nature (PSSN) and the University of Pembangunan Nasional "Veteran" East Java in the committee of the seminar. Furthermore, we certainly expect more programs to come in the near future as the continuation mutual cooperation.

Distinguished Guests, Ladies and Gentlemen,

In this era of globalization, where there have been rapid changes in climate with various implication as a result of the global activities of technology, we really need to be prepared to meet the challenges driven by the global demands. As we know in the developing countries, climate change cause yield declines for the most important crops. This means crop production to supply sufficent food for 2.5 billion people is really depend on the success of our efforts today. This seminar is an opportune time to discuss problems of mutual interest with delegates from some countries. It is gratifying to note that the agenda of the seminar covering a wide range of very interesting items relatingto the natural resources and food security under threat of climate change.

Distinguished Guests, Ladies and Gentlemen,

On behalf of Rector- UPN "Veteran" East Java, I would like to express my gratefulness to the local government, especially mayor of Surabaya for the support given to the committee. My appreciation also goes to the Steering and Organizing Committee who have made this program possible. May congratulate the commitee for success of conducting this international seminar.

Finaly, I wish all the participans success in a productive discussion throughout the seminar and a very pleasant stay in our beautiful city of Surabaya. Thank you.

Prof. Dr. Teguh Soedarto, Ir., MP.
(Rector of Univeristy of Pembangunan Nasional "Veteran" East Java, Surabaya-Indonesia)

Thank god for all the blessings, so that the International seminar with the theme: Natural Resources, Climate Change and Food Security in Developing Countries (ISNAR-C2FS) can be accomplished in accordance with the plan. Theme of this international seminar is based on the fact that in developing countries there has been damage to natural resources by the influence of global warming induced by climate change. Furthermore, we will have an impact on declining world food security. Besides the exploitation of natural resources by humans to obtain excessive profits also have an impact on food security weakness. Even the inability of the economy for the people of developing countries is shown by the low purchasing power is also a cause of food safety problems.

In this international seminar will be discussed and presented orally or in poster the results of research and scientific study of: a). biodiversity and land conservation, b). Adaptation and crop production, c). Bioproduct and post harvest, d). Agroforestry and Environmental Management, e). Social and economic Issues and f). Food Security Strategy and Policy.

International seminar which was attended by about 200 participants from eight countries are expected to generate formulas and useful recommendations for the community from developing countries in anticipation of climate change impacts on natural resources destruction and declining world food security.

International Seminar (ISNAR C2FS) conducted by the Faculty of Agriculture, University of National Development "Veteran" East Java in Surabaya on May 27 and June 28, 2011 is the result of cooperation between the UPN "Veteran" East Java, Philippine Society for the Study of Nature Inc. (PSSN) and Biotec-National Science and Technology Development Agency, Center for Agricultural Biotechnology, Kasetsart University, Thailand. For that we thank him for his participation to the parties, include: keynote speakers, PSSN, Agrcultural Center for Biotechnology, Kasetsart University in Thailand, steering and organizing committee, all participants, UPN "Veteran" East Java, donors and sponsorship.

Finally congratulations to discuss in a seminar that will last two days is hopefully running smoothly and successfully.

Dr. Ramdan Hidayat, Ir., MS.
(Dean of Faculty of Agriculture University Of Pembangunan Nasional " Veteran" East Java , Surabaya-Indonesia)

KEYNOTE SPEECH

THE MINISTRY OF AGRICULTURE - REPUBLIC OF INDONESIA

SUSWONO

Future agriculture development, particularly increasing production to attain and maintain food security facing four main constraints *i.e.* (a) decreasing and degradation of land and water resources, (b) more frequent climate anomaly and climate change, (c) shrinking and conversion of fertile agricultural lands, and (d) fragmentation of present agricultural lands and limited availability of potential lands for expansion.

Increasing intensity of climate anomaly and climate change are threatening national food security and farmers welfare. Climate change with increasing atmospheric temperature will (a) change the rainfall pattern, (b) increasing the frequency of extreme climate such as El Nino and La Nina, and (c) rising the sea level.
Attaining soybean, sugar, meat and maintaining rice and maize self sufficiency is one of four goals in national food security. Climate variability and climate change are the main challenge in the achievement particularly for rice, maize and soybean that are vulnerable to climate change.

In coping with climate change the strategy are mitigation to harness the adverse effect of climate change by reducing GHG emission particularly in developed countries. The effects have been observed and the negative impacts already felt by the poor in the developing countries with limited ability and resources the need adaptation to increase resilience. Without proper anticipation, adaptation and mitigation efforts national food security certainly will be threatened.

Agriculture Complex Linkages to Climate Change Issues

Agriculture development is one of national agenda because of its multiple objectives both for economic and social purposes. It provides devisa and substatially contributes to gross domestic product. Socially, through agriculture rural development and poverty alleviation can be attained. Agriculture is also important politically by enhanciing national integrity by promoting inter-regional trade and environmently through development of sustainable agriculture
Agriculture has strong interlinkage with climate change. Agriculture has strategic role as the biggest employer and staple food provider but also as one of the most vulnerable to climate change. Despite small contribution presently, agriculture development can be directed to become sink by sequestering CO_2 in mitigation efforts.

Climate change is believed by increasing GHG emitted by human activities. Agriculture is one of the GHG sources through development af agricultural lland on peat soils as well as emission from paddy cultivation and livestoccks. GHG emission from agriculture excluding peat and forest fire is only 6%. Forest fire is the biggest contributor (65%), while paddy cultivation and livestock, respetively 24% and 9.3%.

Plants have the ability to absorb carbon in the form of CO2 is very large, some of which are utilized in process plants metabilisme, and most other stored in various form of organic material. At the annual crop of organic material are stacked in

KEYNOTE SPEECH

THE MINISTRY OF AGRICULTURE - REPUBLIC OF INDONESIA

SUSWONO

Future agriculture development, particularly increasing production to attain and maintain food security facing four main constraints *i.e.* (a) decreasing and degradation of land and water resources, (b) more frequent climate anomaly and climate change, (c) shrinking and conversion of fertile agricultural lands, and (d) fragmentation of present agricultural lands and limited availability of potential lands for expansion.

Increasing intensity of climate anomaly and climate change are threatening national food security and farmers welfare. Climate change with increasing atmospheric temperature will (a) change the rainfall pattern, (b) increasing the frequency of extreme climate such as El Nino and La Nina, and (c) rising the sea level.
Attaining soybean, sugar, meat and maintaining rice and maize self sufficiency is one of four goals in national food security. Climate variability and climate change are the main challenge in the achievement particularly for rice, maize and soybean that are vulnerable to climate change.

In coping with climate change the strategy are mitigation to harness the adverse effect of climate change by reducing GHG emission particularly in developed countries. The effects have been observed and the negative impacts already felt by the poor in the developing countries with limited ability and resources the need adaptation to increase resilience. Without proper anticipation, adaptation and mitigation efforts national food security certainly will be threatened.

Agriculture Complex Linkages to Climate Change Issues

Agriculture development is one of national agenda because of its multiple objectives both for economic and social purposes. It provides devisa and substatially contributes to gross domestic product. Socially, through agriculture rural development and poverty alleviation can be attained. Agriculture is also important politically by enhanciing national integrity by promoting inter-regional trade and environmently through development of sustainable agriculture
Agriculture has strong interlinkage with climate change. Agriculture has strategic role as the biggest employer and staple food provider but also as one of the most vulnerable to climate change. Despite small contribution presently, agriculture development can be directed to become sink by sequestering CO_2 in mitigation efforts.

Climate change is believed by increasing GHG emitted by human activities. Agriculture is one of the GHG sources through development af agricultural lland on peat soils as well as emission from paddy cultivation and livestoccks. GHG emission from agriculture excluding peat and forest fire is only 6%. Forest fire is the biggest contributor (65%), while paddy cultivation and livestock, respetively 24% and 9.3%.

Plants have the ability to absorb carbon in the form of CO2 is very large, some of which are utilized in process plants metabilisme, and most other stored in various form of organic material. At the annual crop of organic material are stacked in

various organs of plants (stems, roots, etc.) in the longer term as carbon sequestration.

Impact of Climate Change on Food Security

The impact of climate change on food security which is divided over the continuous impact, dis-constinuous impact, and permanent impact. Impact of continuous, generally caused by changes in precipitation patterns increase in air temperature, whereas discontinuous impact caused by temporary climate change variables, such as extreme climate events (droght, floods, high winds, etc.). Permanent impacts are generally caused by the degradation and/or shrinking resources, especially land and genetic resources,

In general, climate change impacts on the agricultural sector: (a) directly, affecting food production and agriculture through changes in the biophysical conditions of climate and resources, (b) indirectly affect the growth and income distribution that affect the demand for agricultural products, and (c) in a broader context, climate change will also affect the policies and levels even up to the constellation of world politics.

Climate change will affect among others (a) degradation and reduction of agricultural resources particularly land due to flood, drought, inundation and sea water intrusion, (b) decreasing capacity of agriculture infra-structure such as irrigation, (c) decreasing yield and production because of rising temperature, flood and drought, increasing pest and disease, and (d) eventually social and economically increasing poverty.

The impact of climate change on food security which is divided over the impact of continuous, discontinuous and permanent (Boer, 2011). Continuous impact is generally caused by changes in precipitation patterns increase in air temperature, whereas discontinuous impact caused by climate change discontnuous elements too, such as extreme climate events (drought, flooding, high winds, etc.). Permanent impacts are generally caused by the degradation and/or shrinking resources, especially land and genetic resources, eg land downsizing due to increased sea levels or extinction of some species or genetic resources due to whipping the air temperature, etc.

Recent studies (2010) indicate that in 2050 sea level will rise by 50 to 100 cm, causing about 5,251 ha and 14,950 ha or about 0.30% and 0.86% of 1,732,124 ha rice fields along the nothern coast of Java will be inundated. Although proportianally small agregated 50 to 150 thousand tons of rice production will permanently loss annually.

Rate of land degradation including abandoned lands averagely 2 million ha annually. Beside due to deforestation and improper management the degradadtion is due to flood, landslide, drought because of extreme rainfall.

Increasing intensity of extreme climate strongly affects cropping season resulting in delay planting, decreasing yield and even crop failure. Studies of AARD indicate that climate change will increase significantly flood prone agricultural lands including crop failure. During El Nino cropped area decrease by 14% will La Nina will increase the area by 10%. National rice production can decrease due to flood, drought, pest and disease from presently 2.5-5% to 10%. Rising temperature alone can decrease rice production by 10 to 19% in the coming 4 decades.

With proper anticipation and intervention climate change can bring benefit to increase food production during La Nina with longer growing period. Rainfall during La Nina in 2010 cropped area became 109.3% of the target although because of poor anticipation due to pest and disease and post harvest handling productivity became 90.5% and production was only 98.9% of the target.

In the coming years threat of climate change to food security will become more apparent both directly due to pest and disease, shortage of available lands foe expansion due to the new forest and land management policy.

General Strategy and Government Policy

Many evidences showed that global warming and climate change is occurring. Therefore efforts to mitigate climate change through reduction of GHG emission and to increase the resilience of agriculture system to climate change should not be delayed. Delay action may result in more loss and high cost for adaptation. Kemal Dervis, Head of UNDP stated that" *If there is no mitigation....then the impact on developing countries 20-30 years from now will become much more severe and the adaptation needs,climate proofing, building dams against floods, changing crops...will become huge and impossible to handle*".

General policy in coping with climate change in agriculture is priotizing adaptation action program to maintain food security. Action program in mitigation is to support national commitment in reducing GHG emission by 26-41% through environmental fliendly and lo emission technology and farming system development in plantation, food crops and animal husbandry. Although the mitigation efforts are in the context of the four agriculture development goals particularly food security.

Direction and general strategy of agriculture in coping with climate change are stipulated in Agriculture Road Map Strategy in Coping with Climate Change that was launched in early 2010. Technically, the implementation of the strategy is carried out through: (1) optimizing the management of existing land, water and irrigation resources, (2) adjusting cropping patter and soil management particularly for food crops and crop diversification, (3) development and application of adaptive technologies with guideline and tools, and (4) application of environment friendly adaptive technologies.

To support the strategy, the Ministry of Agriculture has indetified and produced as well as developing many innovative adaptive technology either for mitigation and adaptation. Several strategic programs as communication, dissemination and information system can delivered through climate field schools, integrated resource and crop managemant (PTT) and system for rice intensification (SRI), along with support for field school for integrated resource and crop managemant (SLPTT) in all the provinces with rice production centres.

Adaptation strategy is based on several studies, among others are: (a) identification of impacts and vulnerability of agricultural resource and production, (b) identification and chracterization of landl and water resources potential, (c) identification of available adaptive technologies and farming system models. The application of adaptation program is through several programs as:

(a) Development of communication system as agro-meteorology information network (SJII) and field schools (climate, integrated resource and crop management)
(b) Development of farming institution,protection, support, insurance, capital, PUAP etc.

(c) Development and application of adaptive technologies, tools and guidelie preparation ((Permentan No.47/2006, Permentan No.14/2009, UU No.41/2009 (PLPPB), blue print for drought and flood management, cropping calendar maps etc.

(d) Adjustment and development of agriculture infra-structures (JITUT, JITES etc.), and utilization of sub-optimal lands particularly dry lands and swampy lands for food crops, suitable peat particularly those already reclaimeed and abandoned lands.

In addition, strategies and policies to address the impact depends on the level and nature of impact, whether continuous, dis-continuous, or permanent.

a) Continuous impacts addressed among others by the strategy: (i) the development of genetic resources (adaptive varieties) with respect to what kind, how many, where and Pls, (ii) the structural approach and government intervention, (iii) support long run research and development.

b) Dis-continuous impact, faced with a "crash course" and "resque program" supported by the climate forecasting and information systems, development of agricultural insurance system, climate (climate index insurance), etc..

c) Permanent impacts must be addressed by structuring and reorientation of lay put and land resources utilization and land-based climate proof, food diversification and development of indigenous and local wisdom

Strategy and Policy of Goverment for Natural Resources Utilization

As follow up of the commitment to reduce GHG emission by 26 to 41% by 2010, until now has been produced 2 important documents I.E. (a) Letter of Intent on "*Cooperation on reducing greenhouse gas emissions from deforestation and forest degradation*" between Indonesian and Norwegian governments and (b) Presidential Decree No.10/2011 on "Postponement of New Licence and improvement of forest and peat lands".

Presidential Decree No.10/2011 indicates for the time being licence to utilize primary forestand peat land is forbidden for at least 2 yeras except for strategic purpose, including for rice and sugarcane cultivation.

In agriculture perspective the two documents imply positively and negatively. In several occasions government stressing the need to reduce GHG emission without jeopardizing food security and economic growth.

Agriculture land conversion and increasing demand require the expansion of new arable lands. LOI and REDD+ evelopmend and Presidential Decree No.10/2011 will limit the opportunity for new agricultural land expansion. On other hand it will drive the optimation of existing agriculture land utilation and directing agricultural land expansion to more secure and low impact on GHG and environment.

Based on food requirement including horticulture will need 260,000 ha whre 100,000 ha for rice fields annualy. While plantation requires 350,000-450,000 annually (BBSDLP, 2010). For that purpose Ministry of Agriculture directing agriculture development in the future is based on consolidation and optimation of land resources, that imlemented through several programs: (1) Auditing the existing, calculating land requirement and availability of agricultural lands; (2) Optimizing existing agricultural lands; and (3) Protection by avoiding or minimizing agricultural land conversion. Optimizing the existing agricultural land through intensification strategy:

(a) increasing productivity by development and application of breakthrough farming technology, including new adaptive technology, harvest and post harvest technology
(b) Increasing cropping indices
(c) Soil and water conservation to maintain fertility and land productivity and improving the environment
(d) Protection of agricultural land from conversion through enforcement of Agricultural Land Protection Act
(e) Acceleration of the implementation of sustainable agricultural land protection Act No.41/2009, and the implementation of Ministry of Agriculture Regulation No. 53/2007 on Guideline for Mountinous Land Agriculture

For agricultural lands expansion to cater requirement of agricultural products is directed by policy as follow:

(1) Expansion of new agricultural lands priotizes in fulfilling land sfor food crops farming particularly rice through development of new lang by 100,00 ha annualy
(2) New areas priotize the utilization of idle lands or abandoned/dedraded lands particularly the APL areas aspecially mineral soil either in the dry or swampy lands.
(3) New areas for plantation priotize the concecionary land or lands with licence or arleady cleared lands still unutilized
(4) Encourage businesses/concecionary land owners to speed the utilization of idle (abandoned) lands, those have been cleared with penalty of withdrawing the licence or transfering the right
(5) Pushing the implemetation Agririan Reform that been launched 3 year earlier

During the enforcement of Presidential Decree No. 10/2011 Government will evaluate with due dilligent the implication and impacts of the policy both to mitigation aspects through MRV and the impacts on economic growth particularly agricultural sector.

Technology Preparedness to Land Resources Optimation

Direction of adaptive farming system development is aimed to: (a) development of green economy i agriculture as *Indonesia Carbon Efficient Farming* (ICEF), integrated crop livestocks systems (SIPT/SITT), (b) integrated farming system on dry climate (SPTL-KIK), (c) Development of innivative adaptive farming as , SRI, Ekofarming, IP 200-400, (d) land and water resources optimization, increasing productivity and existing agricultural land protection (PLPPB), and (e) expansion of agricultural lands without deforestation, utilization of idle, abandoned and degraded lands.

To support adaptation efforts, direction of adative technology development among other are: (a) development of high yield low emission varieties, drought and inundation tolerant, early and solinity tolerant varieties, (b) innovation of soil and water management, soil tillage, intermitent irrigation, peat soil management technology, compasting technology, (c) zero waste technology through agricultural waste utilization for organic fertilizer, feed and fuel (biogas) development.
Innovative technology for rice crop are (a) soil and water management for water use efficiency, (b) drough and inundation tolerant variety, salinity tolerant, pest and disease resistant and early maturity, (c) integrated pest management and harvest and post harvest handling.

To avoid flood and drought damages , Ministry of Agriculture has distributed Cropping Calendar Atlas as reference for farmers to adjust croppig pattern and cropping time for the whole year in form of map and table by sub-district for four climate scenarios i.e. wet, normal, dry and those practiced in the past years.

Currently Ministry of Agriculture hrough AARD is developing integrated cropping calendar that combines time of planting, cropping pattern, fertilizer and seed recommendation for each sub-district. As climate forecast is announced by the Met Service and others with crpping claendar atlas farmers can plan their food crops particularly rice including t he technology.

To minimize the fllood and drought damages Blue Print to Manage Flood and Drought Participatively ha been published. The book iforms those flood and drought prone areas as priority areas and the coping strategy.

Climate and Technology Information System

Attainment of food security in facing climate change beside depends on preparedness and appropriate technology is also depends on climate information. Climate information for agriculture planning has be provided earlier either by researcher and stakeholders to extension workers and farmers.

Amid changing rainfall pattern, is becoming more frequent extreme events as EL Nino, La Nina and IOD due to climate change. That increase uncentainty in the amount and pattern of rainfall or season onset decreasing the accuracy of rediction. That can overcome with technology development in climate prediction by employing advance instruments and analytical methods.

Therefore, the institutionalization of climate information system and technology is very determining. Climate and technology information management is carried out by related institutions but for the time being AARD along with other institutions involved in Working Group on Climate Variability and Climate Change, and Technical Team of Climate Change of the Ministry of Agriculture.

The Met Service and AARD are the main sources of climate data and information and AARD also as the main source of technology and climate information for agriculture. Both institutions have network and operational units in each province. Local governments, agricultural services in the provinces, districts along with extension workers and farmers in sub-districts and villages are the main techology and information users.

Beside as the main users of climate information farmers are strategic climate information sources through field observation and interpretation both with local wisdom and descriptive approach using simple tools. The role is practiced by farmers group and/or climate field schools that function in producing, processing, and communicating climate information to dtermine farming system, cropping pattern and appropriate technology that is most beneficial and with minimum risks. Field school approach is very appropriate in integrated pest management field school (SLPTT) and intergrated resource and crop management field schools (SLPHT).

Functional working relation and communication among researcher-extension-farmer or structurally between Met Service_Ministry of Agriculture-Local Government/Agriculture Service in the Province--Local Government/Agriculture Service in the District-Extension Coordination-extension worker are determining

factors in the efficacy of climate information system. However, the effictivity of coordiantion system and working relation along with span of control between Central-Province-District particularly in the implementation and span of control of program.

Remarks

There are close linkages between climate change and agriculture, because this sector is most affected and vulnerable but also contribute to the process of climate change, although small.

Climate change is happening and exacerbated by human activities, but also has opportunity to slow down and minimizing the adverse effects. There is strong and close relation between climate change and agriculture, because it is the most vulnerable but also potentially conributing although among the least.

Climate change among others causing more frequent climate anomaly will seriously affect national food security, particularly rice production system. Although agriculture potentially contributing in mitigating but the main priority is in adaptation efforts particularly is securing national rice production.

Beside to adjustment of approaches and technologies and farming patterns, various rescue strategies in food production and national food security is usage optimization of existing farmland and reorient the direction of the development and expansion of new agricultural areas. Optimization efforts are directed at intensification to increase produktivktas crops and land, while the expansion of agriculture is more aimed at potential productivity and land safely (allowed), especially the land abandoned, degraded in the APL.

Climate information systems and technology is one key to the success of the strategy and policy management and development resources to maintain food security in the face of climate change.

TABLE OF CONTENTS

Sub Theme : Agroforestry and Environmental Management
Oral Presentation

Sub Theme : Social and Economic Issues
Oral Presentation

Sub Theme : Strategy and Food Security Policy
Oral Presentation

SUGAR CANE FARMERS RELATIONAL ANALYSIS OF COMMITMENT PLANTATION

Ignatia Martha Hendrati[1] and Flora Pudji Lestari[2]

[1]Faculties of Economic and Post Graduate UPN"Veteran"Jatim
[2]Accounting Staff PTPN XI (Persero) and Alumni of Magister Management
University of Pembangunan Nasional "Veteran"East Java

ABSTRACT

PT Perkebunan Nusantara XI (Persero) which is engaged in sugar industry obtains 70% of its supplies of raw materials from sugar cane farmers. During the last 3 years the supply of sugar cane from farmers tends to decline. The purpose of this study is to analyze four subjects: 1) the influence of communication effectiveness of sugar factory workers to sugar cane farmers' trust to sugar factory; 2) the influence of technical quality given by sugar factories to the trust of sugar cane farmers to sugar factory; 3) the influence of functional quality of sugar factory to sugar cane farmers' trust to the sugar factory; 4) and the influence of trust to relational commitment between sugar cane farmers and sugar factory. The variables used in this study are divided into three groups: (1) exogenous variables namely communication effectiveness, technical quality and functional quality; (2) an intervening variable that is trust; (3) endogenous variable that is relational commitment. Measurement scale used is Likert's scale ranging from 1 to 5. The samples in this study were sugar cane farmers in 16 sugar factories of the working area of PT Perkebunan Nusantara XI (Persero). The sampling method is probability sampling, with a sample of 387 respondents. This study uses Structural Equation Modeling as a tool of data analysis. The results of this study demonstrate that the effectiveness of communication has contributed to the trust; technical quality has no contribution to the trust; the functional quality has no contribution to the trust; and the trust has contributed to relational commitment.

Keywords: communication effectiveness, technical quality, functional quality and relational commitment

INTRODUCTION

Sugar is one of strategic commodities in the Indonesian economy because its existence is vital to meet the needs of the community. Phenomena that occur in PTPN XI (Persero), which manages 16 Sugar Factory and has contributed about 18% of national sugar production, in the past 10 years sugar production has fluctuated, and tended to decline in the last 3 years.

Most of the raw materials Sugar cane factory in PTPN XI (Persero) which is about 70% obtained from the farmers, the rest of the land lease and a small right to cultivate self-managed. In the last ten years, supply of raw materials derived from sugar cane people tend to fluctuate and decline in the last 3 years.

The number of people constancy of supply of sugar cane, among others, influenced by the quality of partnership relationships between sugarcane farmers and sugar mills. Increasing competition in the acquisition of raw materials among the people of cane sugar factories in East Java sugar factory requires to improve the quality of partnership relationships with farmers. Partnerships as a form of relational commitment between farmers and sugar mills are good, will create mutual benefits and sustainability of production. The success of the partnership is determined by the benefits received by both parties to see the satisfaction of partner farmers.

This study seeks to analyze whether the effectiveness of communication, quality of technical and functional service that is delivered by the sugar mills will establish a trust to establish long-term relational commitments.

Problem Formulation

As described above, this research problem can be formulated as follows:

1. Is the effectiveness of communication affects trust sugar mill workers at a sugar factory farmer?
2. Is the technical quality of a given sugar mill affect farmers' confidence in the sugar factory?
3. Is the quality of a given functional sugar mill affect farmers' confidence in the sugar factory?
4. Does the trust of farmers used effects the relational commitment between farmers and sugar mills?

Theoretical and Conceptual Framework

Communication Effectiveness

Effendi (2001 in Cahyanto: 2007) stated communication to be effective if it can be said to have an impact are: 1) cognitive, ie, increasing knowledge communicant, 2) Affective, ie change communicant view, because he was moved due to communication and 3) Behavioral changes in behavior that is or actions that occur on the communicant.

Effectiveness of communication efforts is how to contact farmers on a regular basis, providing timely information, to establish intimacy, to create closeness, answer their questions and provide follow-up significantly

Service Quality

Gronroos (1984) divides into 2 dimensions of service quality, namely: technical (technical quality) and functional (functional quality). The technical quality is what customers get, whereas functional quality refers to how they receive services. The technical quality relates to actual results or core service perceived by customers (Lovelock, 1996). While functional quality is conceptualized as responsive behavior polite, caring and professional.

Trust

Research Maharsi & Fenny (2006) said that Mukherjee and Nath (2003) explains that trust can be measured through:

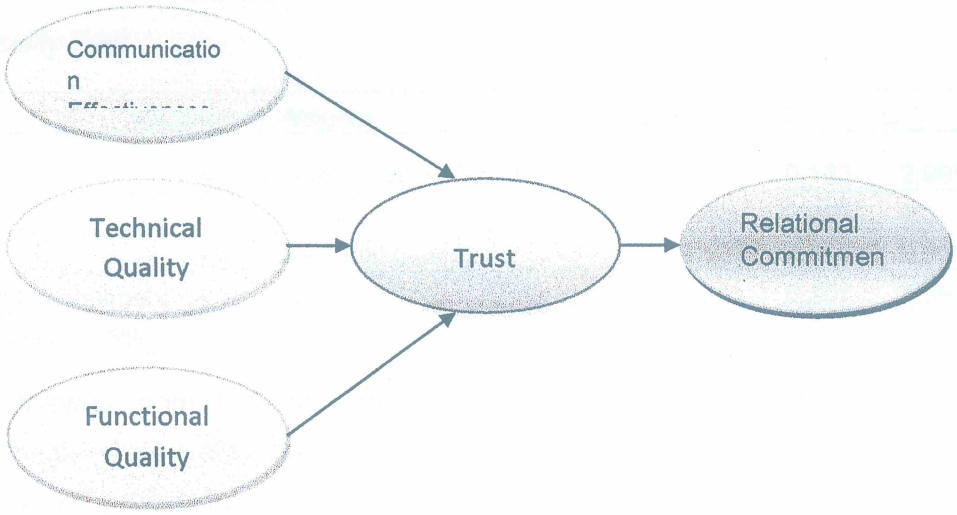
1. Technology orientation is the amount of consumer confidence on the technology used.
2. Reputation, When consumers receive services from a company they would consider the reputation of the company where reputation is a very important factor of trust. When consumers feel a company has a bad reputation, they would be lazy to use the services of the company.
3. Perceived Risk, The amount of consumer perception of risk affects the size of their trust in companies and services from the company.

Relational Commitment

According Indarjo (2002 in Arifianto: 2005), commitment is defined as the attitude and behavior that reflects the closeness of the relationship between the two parties closer the two become a whole part. Commitment can be measured using a 3 (three) scales of measurement are:

1. Affective Commitment
   It is the will to continue the relationship because of positive effects on partners.
2. Hope will be the continuation of the relationship
   Includes both the perception and the will of the company concerned consumers to stay in the relationship.
3. Willingness to invest
   Reflect a will to do something more than simply survive in the relationship. Relational commitment in the context of partnerships between farmers and sugar mills begins when farmers are willing to accept a partner Sugar Factory. The willingness of farmers realized in a written agreement

concerning the distribution of Food Security Credit (KKPE) and milling sugarcane.



MATERIALS AND METHOD

Population and sample

1. The population in this study were sugar cane farmers who are bound in KKPE credit agreement / contract milling and Sugar Factory has partnered with a minimum of 5 years, with the aim has been to understand and feel the partnership in 4813 the total sugar factory.
2. Probability sampling techniques using sampling
3. The size of the sample using the formula Slovin = 369 samples are divided in proportion to 16 Sugar Factory

Technical Analysis

The data analysis technique used in this study is Structural Equation Modeling (SEM) is a multivariate method that allows researchers to examine the complex relationship between variables. SEM is an integrated approach between the factor analysis, structural model and path analysis (path).

By using SEM to be 3 (three) events simultaneously, namely the examination of validity and reliability of the instrument (confirmatory factor analysis), testing models of the relationship between variables (path analysis), and get a useful model for prediction (structural models and regression analysis).

RESULTS AND DISCUSSION

Causality Test

Regression Weights			Estimate	S.E.	C.R.	P
Trust	<--	Communication Effectiveness	0,457	0,153	2,995	0,003
Trust	<--	Technical Quality	0,089	0,068	1,311	0,190
Trust	<--	Functional Quality	-0,122	0,151	-0,813	0,416
Relational Commitment	<--	Trust	0,91	0,207	4,397	0
Batas signifikansi 5%						□ 0,05

Viewed from the direction of causal relationships probability level, the hypothesis which states that:

a. Causal probability of 0.003 <0.050, so it can be said that the factors influence the effectiveness of communication and trust factor with the direction of significant positive relationship
b. Causal probability of 0.190> 0.050, in other words technical quality factor does not affect the trust factor is not significant and positive relationship with the direction
c. Causal probability of 0.416> 0.050, in other words functional quality factor does not affect the trust factor is not significant and negative correlation with the direction
d. Causal very small probability of 0.000 <0.050, so it can be said that factors affect trust and relational commitment factor significantly with the direction of a positive relationship

Influence of Communication Effectiveness of Trust

Based on the research that has been done to analyze the influence of communication effectiveness of the trust showed that the effectiveness of communication significantly influences trust.

This is consistent with the results of previous research by Morgan & Hunt (1994), Sharma & Patterson (1999) and also stressed that timely communication is important to align perception and thus encourage confidence.

Farmers argued that the communication submitted by the sugar mill workers either orally, or by a partnership forum meetings are very beneficial for them and foster their trust in the sugar factory. In accordance with the dominant frequency of

respondents' answers on the indicator increased knowledge so that future efforts need to be an effective delivery of communications to further increase the confidence of farmers

Effect of Technical Quality of confidence

According to Sharma & Patterson (1999), technical quality refers to the competence in achieving the best ROI for their clients at the level of acceptable risk, thus helping clients to achieve their financial goals. Gounaris (2003) also believes the quality of services, especially the dimensions associated with major services offered to clients (output quality) as the reinforcement bond of trust.

The results of this study indicate that the technical quality does not affect the beliefs, so contrary to previous research. This is because given the technical quality of sugar mills to farmers has not been satisfactory. Judging from the results of the dominant frequency of respondents' answers on the actual outcome indicators, the farmers wanted the credit which is very useful for the management of sugarcane and to produce satisfactory results from the milling of sugar cane.

Influence Functional Quality of confidence

According to Coulter, 2003 in Sharma & Patterson: 1999, personality-related and performance related to the dimensions of service quality has a positive influence on trust, therefore the process of service delivery and creation are important in shaping beliefs. The consequences of quality (Parasuraman et al. 1988; Ostrom and Lacobucci 1995; Cronin et al. 2000; Holbrook 1999 in Sharma & Patterson 1999). Also seen as a direct antecedent of trust and / or relationship commitment.

In this study, functional quality with a trust relationship is not significant, or functional quality has no contribution to the trust, so that contrary to previous research. This is because the functional quality of a given sugar mills to the farmers is less satisfactory.Judging from the results of the dominant frequency of respondents' answers on the speed indicator so that the desired service farmers in lending is the speed and the speed in getting the rest of the results.

Effect of trust on relational commitment

In the study Bagdoniene (2009) that the trust became the main requirement for the continuation of the relationship (Doney & Cannon, 1997; Sharma & Pattersson: 1999) and their success (Kramer & Tyler, 1995). Smaliukien□ (2005)

also argues that the trust encourages open communication between partners, exchange ideas and share resources.

Trust as a basic construction in most of the long-term activities, particularly for professional services, is described by Jaakkola & Halinen (2006), Sharma & Patterson (1999). Galbreath (2002) noted, that if the parties involved believe that all people will do what is held and both sides will benefit, turn into a reliable relationship.This is the basis for win-win strategy in the development of relations. Dynamic relationship, from time to time, and growing.

Opinions above in accordance with the results of research that the trust has contributed to relational commitments. Judging from the frequency of respondents will invest predominantly in the indicator, then the confidence of farmers to plant sugar will strengthen long-term relational commitment to maintaining relationships and partnerships will ultimately increase the interest of farmers to invest by adding acreage and supply of sugarcane

Limitations

1. Collecting data in this study conducted a cross sectional, because of time constraints the research so that the phenomenon under study is only a momentary picture, causing the respondents in filling in the questionnaire influenced the perception at that time, consequently the results of the study does not fully support the theory.
2. Different levels of education and knowledge of farmers and characteristics of perpetrators in the sugar industry in Indonesia are less likely to be changed could be causing the results of this study differ from previous research findings, due to possible patterns of relationship between sugar mills and farmers were also different.

CONCLUSION

1. The variable effectiveness of communication have contributed to the trust.
2. Variables do not have the technical quality of contribution to the trust.
3. Variable functional quality has no contribution to the trust.
4. Variable beliefs have contributed to relational commitment.

REFERENCES

REFERENCE

Arifianto, Yuniar.2005. ***Analisa Pengaruh kualitas Pelayanan : Kualitas Produk, Komitmen Pelanggan, Kepercayaan Pelanggan, Dan Harga Produk Terhadap Loyalitas Pelanggan***. Skripsi. Fakultas Ekonomi Universitas Diponegoro Semarang.

Bagdoniene, Liudmila dan Rasa Jaksataite.2009. ***Trust As Basis For Development Of Relationships Between Professional Service Providers And Their Clients.*** Kaunas University of Technology, Lithuania. Economics & Management.14.

Cahyanto, Ponti Gesang. 2007. ***Efektifitas Komunikasi Partisipatif Dalam Melaksanakan Prima Tani di Kecamatan Sungai Kakap Kabupaten Pontianak.***Tesis, Pasca Sarjana Institut Pertanian Bogor.

Kramer & Tyler, 1995, ***Trust in Organizations : Frontiers of Theory and Research***, Thousands Oak, CA, Sage

Doney & Cannon, 1997, ***An Examination in the Nature of Trust on Buyer Seller Relationships***, Journal of Marketing, Volume 61, no.2, p 35-51

Galbreath. J, 2002, ***Twenty-first century management rules: the management of relationships as intangible assets***, Management decision 40 (2), 116-126

Gounaris Spiros P.2003. ***Trust and Commitment Influences on Customer Retention: Insights from Business-to-Business Services***. Department of Marketing and Communication, Athens University of Economics and Business, Greece.Journal of Business Research 58 (2005) 126–140

Groonroos, Christian.1994. ***From Marketing Mix to Relationship Marketing: Towards a Paradigm Shift in Marketing*** Management Decision, Vol. 32 No. 2, pp. 4-20.MCB University Press Limited, 0025-1747

Jaakkola, A Halinen, 2006, ***Problem solving within professional services: evidence from the medical field***, International Journal of Service Industry Management 17 (5), 409-429

Lovelock, 1996, Services Marketing, 3rd.ed. Upper Saddle River, NJ, Prentice Hall

Maharsi, Sri dan Fenny.2003. ***Analisa Faktor-Faktor yang Mempengaruhi Kepercayaan dan Pengaruh Kepercayaan Terhadap Loyalitas Pengguna Internet Banking di Surabaya***. Jurusan Ekonomi Akuntansi, Fakultas Ekonomi - Universitas Kristen Petra. Jurnal Akuntansi dan Keuangan, Vol 8 No.1: 35-5

Morgan, Robert M & Hunt, Shelby D.1994. ***The Commitment-Trust Theory of Relationship Marketing*** .Journal of Marketing Vol. 58 (July 1994), 20-38

Avinandan Mukherjee, Prithwiraj Nath, (2003) ***"A model of trust in online relationship banking",*** International Journal of Bank Marketing, Vol. 21 Iss: 1, pp.5 - 15

Sharma, Neeru and Paul G. Patterson.1999. **The *impact* of *communication effectiveness* and *service quality on relationship commitment in consumer*, professional *services*.** The Journal of *Services* Marketing Vol. 13, Iss. 2; pg. 151

Smaliukienė, 2005, ***Public–private partnership and its influence to corporate social responsibility***, Public Policy and Administration Research Journal, Vol. 1 no. 12